

## **Paper WES-2017-41**

This paper presents an interesting approach for fatigue design of floating offshore turbines. Paper is very well written and organised. The following summarises some comments that for the authors' consideration before the paper is published in the journal:

### **Comments**

1. Introduction – it is recommended to explain briefly in more detail why fatigue life estimation for FOWTs is more complicated than in the case of offshore wind turbines with rigid foundations.
2. References: No need to include the full title of the paper. Including author and year of publication should be enough.
3. All abbreviations (e.g. NATAF) need to be explained.
4. “Centre” not “center”
5. Page 2, Line 4: explain what simplified methods you are referring to.
6. Fig. 5: assess quantitatively the extent to which the sampled data plotted here represents statistically the 3D measurement data.
7. Page 2, line 7: Add a reference to literature presenting the Palmgren-Miner fatigue life model.
8. Page 10, line 5: The explanation given in the following sentence is not sufficiently clear – “The total simulation length.....using 6 wind fields of 10-minute length.” Why did you use 6 wind fields? Did you use 10min average data to represent hourly conditions? I would expect that using 10 min data would be more conservative only when the same values are used to represent typical hourly values (averaging would reduce peaks).
9. Page 7, line 4 – add reference to literature of ANSYS AQWA©.
10. Page 10 – last para.: add references to literature recommending values of  $m$  for different materials.
11. Page 13, 1<sup>st</sup> para: provide a physical reason for the underestimation at low number of samples.
12. Fig. 10 shows that the number of samples is small for the high wind speed regime (>10m/s). Higher wind speeds result in higher material stress. To what extent does the smaller number of samples yield reliable predictions for fatigue life at high wind speeds? Would constant speed operation for above rated windspeeds play a role here?
13. Comment on the computational cost savings when adopting the proposed approach when compared to existing methods.

14. It is recommended in the conclusions to suggest values for factor of safety to compensate for limitations of the method.